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MCDERMOTT WILL & EMERY LLP  
18191 VON KARMAN AVE.  
SUITE 500  
IRVINE, CA 92612-7108

EXAMINER

DINH, TIEN QUANG

ART UNIT	PAPER NUMBER
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3644

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-9, 11, 12, 14, 15, and 21-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Please note that “tending to generate vibrations” is vague and indefinite. What does “tending” mean? What qualifies it as “tending”? Does any force “tend” to cause vibration? Please explain.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 12, and 22, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischell in view of Simonian or Schulte.

Fischell discloses a spacecraft having a bus that carries instruments 16 that generate heat. Fischell also discloses an active cooler (that tends to cause vibration) and thermal panels

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mounted to the spacecraft at a location spatially separated from the instrument. Fischell is silent on the kinematic mount to kinematically isolate the instrument from the other parts of the spacecraft. However, Simonian or Schulte teaches that the use of kinematic mounts is well known in this day and age.

It would have been obvious to one of ordinary skill in the art to have used kinematic mounts in Fischell's system as taught by Simonian or Schulte to prevent unwanted vibrations.

Please note that the active cooler that includes elements 26, pipes 20, and panel 21 do not substantially transfer mechanical vibration to the instrument. See figure 2. The active cooler thermally coupled between the instrument and the radiator panels. Plus figures 3 and 6 show that the active coolers do not substantially transfer mechanical vibration to the instruments 42, 67. Please note that the active coolers are at a location that is spatially separated and mechanically isolated from the instrument.

Claims 2, 3, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischell as modified by Simonian or Schulte in view of the admitted prior art on page 8 (paragraph 26).

Fischell as modified by Simonian or Schulte discloses all claimed parts except for the active cooler being a cryocooler. However, the admitted prior art teaches cryocoolers having compressors and cold head assembly that includes cold finger are well known.

It would have been obvious to one skilled in the art at the time the invention was made to have used cryocoolers having compressors and cold head assembly that includes cold finger in

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Fischell's system as modified by Simonian or Schulte as taught by the admitted prior art for a more efficiently temperature control system. Please note that mounting the cryocoolers to the north thermal radiator panel is a step that one skilled in the art would have taken to accommodate the spacecraft for certain missions.

Re claims 9, 10, and 13, please note that the use of multiple active coolers for thermal capability, redundancy, and reliability are steps that one skilled in the art would have taken to improve the safe operation of the spacecraft.

Claims 4-8, 14, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischell as modified by Simonian or Schulte and the admitted prior art as applied to claims 1-3 above, and further in view of Feger.

Fischell as modified by Simonian or Schulte and the admitted prior art discloses all claimed parts except for the thermal link having braided copper. However, Feger discloses that thermal links made up of braided copper are well known in the art.

It would have been obvious to one skilled in the art at the time the invention was made to have used thermal links made out of braided copper in Fischell's system as modified by Simonian or Schulte and the admitted prior art and as taught by Feger to have a more efficiently temperature control system.

Re claim 8, please note that it is an obvious option for one skilled in the art to have a working fluid tube passing through an opening in an earth platform of the spacecraft for access to the instrument portion to be cooled so that the spacecraft can efficiently control the internal temperature.

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Please note that the use of a bank of multiple stage active coolers is obvious to one skilled in the art so that the spacecraft can be efficiently controlled.

Please note that the admitted prior art teaches that cryocoolers are well known. One skilled in the art would have used multiple stage cryocoolers and multiple links from the cryocoolers to efficiently control the temperature of the spacecraft.

Please note that the use of multiple coolers involved only routine steps that one skilled in the art would have taken to provide further cooling or for redundancy.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischell as modified by Simonian or Schulte in view of Gelon et al.

Fischell as modified by Simonian or Schulte discloses all claimed parts except for the closed loop control system. However, Gelon et al teaches that a closed loop control system is well known.

It would have been obvious to one skilled in the art at the time the invention was made to have used a closed loop control system in Fischell's system as modified by Simonian or Schulte and as taught by Gelon et al to efficiently control the temperature of the spacecraft.

Claims 15 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischell as modified by Simonian or Schulte in view of Caplin.

Fischell as modified by Simonian or Schulte discloses all claimed parts except for the solar array. However, Caplin teaches that solar panels are well known.

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It would have been obvious to one skilled in the art at the time the invention was made to have used solar panels in Fischell's system as modified by Simonian or Schulte and as taught by Caplin for generating power.

Please note that the active coolers would inherently eliminate a need to perform a yaw flip of the spacecraft required to prevent radiator sun exposure since the coolers reduced the heat generated in/on the spacecraft.

Please also note that the solar array wings is capable of minimizing the solar pressure torque, the frequent momentum-adjust maneuvers, and a need to carry a large amount of moment-adjust propellant.

### ***Response to Arguments***

In response to applicant's arguments that Fischell does not teach an active cooler "tending to generate vibrations", the Examiner respectfully disagrees since it is vague what "tending to generate vibrations" means as noted above. Please also note that Fischell's coolers do indeed tend to generate vibrations if there is a force being applied to it. If the spacecraft were to say experience turbulence, then the cooler will tend to generate vibrations. Hence, this meets what has been claimed. Furthermore, the applicant seems to argue that Fischell's coolers are not active since they do not generate vibrations. The Examiner believes that this is the wrong conclusion. If Fischell's coolers experience turbulence (large forces acting on the spacecraft such as a meteor), then the coolers will generate vibrations.

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As for the arguments on Simonian and Schulte, please note that the Examiner used these teachings to show that kinematic mounts are very known in the art. Since Fischell's system can experience vibrations, then the kinematic mounts would help reduce such unwanted vibrations.

Feger, Gelon, and Caplin were used to reject the claimed parts. These references teach that the claimed parts are well known to improve the system that they are in.

***Allowable Subject Matter***

Claim 21 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 26 and 27 are allowed.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,



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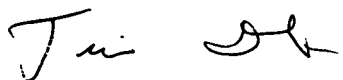
however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tien Dinh whose telephone number is 571-272-6899. The examiner can normally be reached on 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TD

A handwritten signature in black ink, appearing to read "Tien Dinh", with a stylized flourish at the end.